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AUTHOR Muir, Marion S.; deCharms, Richard
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ABSTRACT

This study is one in a series investigating the relationship between motivation training and measures of individual motivation and school behavior of elementary school pupils. One-hundred and twenty-two seventh grade students from an inner-city school district were divided into experimental and control groups by random assignment of classrooms. Motivation training was given to teachers in the experimental classrooms and then training units emphasizing feelings of personal causation were designed by the authors in collaboration with the teachers and used by the teachers in their classrooms. Effects of the motivation training on the experimental children were not significant in the sample although trends suggested that a larger sample (which can be scored) might make the trends significant. The measure of personal causation motivation used in a previous study was coded for two subscales measuring intrinsically relevant motivation and imposed motivation. Using these two measures in conjunction with a measure of ability (intelligence), it was possible to demonstrate significant portions of variance accounted for by the motivation measure over and above that accounted for by intelligence. (Author)

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Personal Causation Training And Goal Setting in Seventh Grade

Marion S. Muir & Richard deCharms[1]

Graduate Institute of Education
Washington University
St. Louis, Missouri

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Conceptual Framework

In a longitudinal field experiment, deCharms (in press) demonstrated that the concept of personal causation could be measured and that training designed to increase personal causation in elementary school children resulted in increased in academic achievement as well as in other predicted changes related to classroom activity. This paper reports results of continuing attempts to measure and change variables related to motivation in schools.

Personal causation (deCharms, 1968) has its roots in Heider's internal locus of causality for behavior (1958) and is based on the assumption that man's primary motivational propensity is to be effective in producing desired changes in his environment. Personal causation is viewed as a human conceptual framework (deCharms and Shea, 1974) and is based on the concept of a person as an <u>agent</u> in the world. In short-hand terms, an individual who initiates intentional action and who experiences self to be the locus of causality, is called an Origin. In contrast, the individual who experiences his behavior as being impelled from without is called a Pawn. In one laboratory study Kuperman (1967) found large differences

in reported liking for an Origin (as opposed to Pawn) working situation as well as increased feelings of freedom and self-directedness. In a follow-up study deCharms, Dougherty & Wurtz (reported in deCharms, 1968) obtained behavioral measures of task accomplishment and recall of the project, and reports of increased liking and feelings of freedom in the Origin situation.

As a human conceptual framework, personal causation refers to the particular sets of meanings that individuals give to their experiences. Just as specific situations like those discussed above may affect one's experience, so too do individuals bring their human conceptual framework to diverse situations. Thus, some individuals are assumed more typically to act as agents in dealing with their environments while other individuals more typically behave in response to external demands.

To measure the Origin-Pawn dimension of personal causation Plimpton (1970) constructed and validated a content-analytic system for scoring the free responses of 5th through 8th grade children. Her Origin categories in the content analysis were (a) internal goal setting, (b) internal determination of instrumental activity, (c) reality perception, (d) personal responsibility, (e) self confidence, and (f) internal control. When used to code children's stories, the Origin scoring system successfully discriminated (1) between students who had experienced personal causation training and those who were not trained, and

(2) between high and low achievement on standardized school measures. Furthermore, change in the Origin score that was a function of personal causation training was related to change on academic achievement (see deCharms, 1972 and in press, for a detailed examination of these results).

The experimental input called Personal Causation training involved a two-step process. First, the teachers attended a motivation training session (similar to the achievement motivation training used by McClelland and Winter, 1969). During the year following the training, the research staff and experimental teachers (sixth grade) developed classroom exercises designed to emphasize four major concepts, namely, (a) self concept, (b) achievement motivation, (c) realistic goal setting, (d) the Origin-Pawn concept. A similar two-step training process occurred the following year in the seventh grade, with the results reported earlier based on an analysis of the two-year training process and follow-up.

The present paper reports some of the data from a follow-up study the design of which was similar to the deCharms (in press) study. In the new study attempts were made (a) to refine the motivation training, and (b) to refine the Origin measure in light of earlier results.

The training given to the subjects concentrated on relating motivation feelings to behavior in the school. The concepts of achievement motivation and risk-taking that had a prominent part in the earlier study were dropped entirely and the feelings of being an Origin or Pawn were stressed rather than the concepts themselves.

The refinement of the content analytic measure is the major focus of the present paper. Plimpton's original manual stressed goal-setting that led to action, but lumped together self-set goals and goals set by others such as the teacher. Self-set goals have intrinsic relevance to the person but goals set by others have imposed relevance (Schutz, 1970). Both are potentially important determiners of behavior but recent evidence (deCharms, 1968; Lepper, Greene & Nisbett, 1973; Deci, in press) suggests that they may have differential effects on behavior.

In predicting behavior such as academic achievement both motivational factors should be taken into account. A prediction model must also include a measure of ability. We start then with the following model:

Academic Achievement = f(Intrinsic motivation + imposed motivation + ability).

Reasoning thus two subscales of the Origin measure were developed. The effects of classroom training units on

the intrinsic and imposed scales were investigated and then, using the model suggested above, a multiple regression analysis was performed on untrained children only to determine the utility of the motivation measure in combination with a measure of ability in predicting academic achievement.

Methodology

Subjects

Twenty-two teachers from a predominantly Black inner-city school district were randomly assigned to trained and untrained groups. All students who were present at time of testing were given the motivation measures, but a random sample of three girls and three boys from each classroom was selected for this analysis. When the data on I.Q. and academic achievement were obtained from the school district complete data were not available for all students which accounts for small differences in the number of students in the regression analysis.

The first analysis of the effects of training (sample 1, Table 1) was computed on a smaller number of untrained students (N=30) and a larger number of trained students (N=85), for reasons dictated by the larger study but unrelated to this paper.

Motivation Training

The training involved a two-step process. First, the experimental teachers attended a weeklong residential training (Cf. deCharms, in press, for a detailed description)

to encourage (a) self-study and evaluation of personal motives, (b) conceptualizing of personal causation, (c) careful planning and realistic goal setting, and (d) enhancing students' feelings of personal causation. In the second step the experimental teachers met bimonthly from September to April with the project staff to develop training units for their students which they then implemented in their classrooms. The student training differed from Personal Causation Training (deCharms, in press) in that the training emphasized self-study and affective development. Training continued for approximately one-half of the school year rather than the full year. Practice in setting goals, planning activity toward goal attainment and checking progress of goal attainment constituted about one-third of the training. The student units for September through January were (a) Collage of Me, (b) Someone I Look Up To, (c) Charades, (d) This I Believe, and (e) a Rumor Game. In February and March the Origin concept and goal setting was introduced with the Origin Manual. (A final unit on Origin Stories was introduced after the dependent measures were collected and therefore has no bearing on the present paper.)

Motivation Measure

Students were asked to write six imaginative stories to cues adapted from Winterbottom (1958). The stories were content

analysized independently by two scorers (percentage of agreement = +.91) for the presence of five Origin categories developed by Plimpton (1969), namely; Internal Goal Setting, Internal Instrumental Activity, Reality Perception, Personal Responsibility, and Self-Confidence. The distinction between intrinsic relevance and imposed relevance was made for each of the above categories on an exclusive basis, e.g. in any one story a statement of activity instrumental to the goal was either intrinsically determined or imposed by circumstances or another person. Because of the characteristics of the stories a decision was made for each category. (For more detail see Appendix A).

A student's score for intrinsically relevant measure was the sum of all categories in six stories (total possible = 30) judged to be intrinsic. A student's score for the imposed measure was the sum of all categories in the same six stories (total possible = 30) judged to be imposed.

Results

Table 1 presents the mean scores on the motivation measures for the experimentally trained children compared with untrained control children. Sample 1 includes 66 randomly selected experimentals plus nineteen other subjects from two classrooms when all subjects with complete data were scored for the motivation measures. In this analysis the control Ss

came from seven classrooms. These data show a significant difference between experimentals and controls on the intrinsic goal motivation measure. The experimentals have a higher mean. On the imposed goal measure the controls have a higher mean but the difference is not significant.

Insert Table 1 about here

The second sample was analyzed because it was discovered that the non-randomly chosen subjects in sample 1 were all relatively high on IQ. The second analysis (Sample 2, Table 1) is not independent of the first, i.e., it is not a replication since many of the same subjects appear. Rather it meets the requirements of equal random selection from each classroom. The means in the second sample show the same trends as in the sample 1. Analysis of variance, however, does not reveal significance. The conservative conclusion to be drawn, despite the one significant p-value, is that training did not have significant effects on the Origin measure. (Data are available to draw a larger sample but results are not available at the present writing.)

Table 2 presents the intercorrelations between the two motivation measures and IQ in both experimental and control subjects. It is clear that intrinsic and imposed goal motivation scores are uncorrelated but that there are moderate

Table 1

Mean Origin Scores (Intrinsic and Imposed Goals)
For Experimental and Control Students
In Two Samples

SAMPLE 1[a]

	Experimentals N=85	Controls N=36	
	$\bar{X}$	$\bar{X}$	
Intrinsic Goals	5.80	4.27	$p<.04$
Imposed Goals	1.67	2.03	
I.Q.	92.89	92.06	

SAMPLE 2[b]

	Experimentals N=66	Controls N=66
	$\bar{X}$	$\bar{X}$
Intrinsic Goals	5.19	4.33
Imposed Goals	1.76	1.90
I.Q.	91.50	92.50

a. Random sample of sixty-six experimentals and thirty-six controls with nineteen non-randomly selected experimentals included.

b. Random sample of sixty-six experimentals and sixty-six controls. Not independent of Sample 1.

relationships between both motivation measures and I.Q.

Insert Table 2 about here

Table 3 presents data on control subjects only relevant to the prediction of the vocabulary subscale of the Iowa Test of Basic Skills from I.Q. and the motivation measures. The table includes the multiple correlations adding one variable at a time from top to bottom of table, the percentage of variance accounted for by each multiple correlation, the increase in variance accounted for, and in the last column the simple correlation between the variables. Table 3 shows that the imposed goal measure accounts for 17% of the variance of vocabulary, the intrinsic goal measure adds another 12% and I.Q. adds another 20%. Altogether they account for one-half of the variance (49%).

Insert Table 3 about here

Table 4 presents the same format and subjects for the reading subscale of the Iowa Test of Basic Skills. The intrinsic goal measure accounts for 8% of the variance of reading, the imposed goal measure adds 6% of the variance and I.Q. adds 34% of the variance. The full model accounts for 48% of the variance of reading.

Insert Table 4 about here

Table 5 presents the breakdown of the language variance.

Table 2

Intercorrelations Among Intrinsic
And Imposed Goal Setting Measures and I.Q.
(Experimental and Control Students)

CONTROLS
N=66

	Intrinsic	Imposed
Intrinsic Goals		
Imposed Goals	+.10	
I.Q.	+.36	+.20

EXPERIMENTALS
N=66

	Intrinsic	Imposed
Intrinsic Goals		
Imposed Goals	-.02	
I.Q.	+.29	+.39

Table 3

Multiple Correlations between
Motivation Measures, I.Q. and the
Vocabulary
Subscale of the Iowa Test of Basic Skills
Including Percentage of Variance Accounted For

N=60

	Multiple R	% of Variance Accounted For	Increase in % of Variance Accounted For	Simple r
Interest				
Imposed	+.41	17%	17%	+.41
Intrinsic	+.54	29%	12%	+.37
I.Q.	+.70	49%	20%	+.61

Table 4

Multiple Correlations Between
Motivation Measures, I.Q. and the
Reading
Subscale of the Iowa Test of Basic Skills
Including Percentage of Variance Accounted For

N=50

	Multiple R	% of Variance Accounted For	Increase in % of Variance Accounted For	Simple r
Measures				
Intrinsic	+.28	8%	8%	+.28
Imposed	+.37	14%	6%	+.25
I.Q.	+.69	48%	34%	+.68

The intrinsic goal measure accounts for 14% of the variance, the imposed goal measure adds 3% and IQ 35%. Together intrinsic, imposed goal measures and IQ account for 52% of the language scale variance.

Insert Table 5 about here

Table 6 presents the arithmetic scale. The imposed goal measure accounts for 13%, the intrinsic goal measure add 5% and IQ adds 18% of the variance of the arithmetic scale. Together they account for 37% of the arithmetic variance.

Insert Table 6 about here

Partial correlations demonstrate that the motivation measures account for significant variance over and above that accounted for by IQ alone. The partial correlation between intrinsic goal and vocabulary with IQ partialed out is +.24, $p < .05$. A similar partial between imposed motivation and vocabulary is +.42, $p < .001$.

For reading neither of the partial correlations is significant indicating that the motivation measures do not account for significant variance above IQ.

For language the partial correlation with intrinsic motivation measure is +.23, $p < .05$. The partial with

Table 5

Multiple Correlations Between
Motivation Measures, I.Q. and the
Language
Subscale of the Iowa Test of Basic Skills
Including Percentage of Variance Accounted For

N=60

Measures	Multiple R	% of Variance Accounted For	Increase in % of Variance Accounted For	Simple r
Intrinsic	+.37	14%	14%	+.37
Imposed	+.41	17%	3%	+.19
I.Q.	+.72	52%	35%	+.71

Table 6

Multiple Correlations Between
Motivation Measures, I.Q. and the
Arithmetic
Subscale of the Iowa Test of Basic Skills
Including Percentage of Variance Accounted For

N=60

Measures	Multiple R	% of Variance Accounted For	Increase in % of Variance Accounted For	Simple r
Imposed	+.37	13%	13%	+.36
Intrinsic	+.49	18%	5%	+.24
I.Q.	+.61	37%	19%	+.54

imposed is not significant.

For arithmetic the partial correlation with imposed motivation measure is +.34, $p < .01$. The partial with intrinsic is not significant.

Discussion

DeCharms (1972) previously reported significant differences between personal causation trained and untrained students on the Origin measure. The data reported here do not replicate this finding. Two changes in the research explain these differences. The experimental training emphasized self-concept and affective expression rather than the intensive training in goal setting emphasized in the previous study. While the trained students in this study did receive some training in goal setting, they did not intensively practice setting intrinsically relevant goals, planning activity, evaluating blocks, taking responsibility or checking progress. Nor was the acceptance of teacher imposed goals emphasized. The training in goal setting the children did receive, however, produced a trend toward higher intrinsically relevant goal setting in the experimental than in the control group. This trend will be clarified when another sample of protocols is scored.

The second difference between this study and deCharms' previous study concerns the Origin scoring procedure. Each

of the five categories was divided into either an internally controlled, self-determined (intrinsic) category or an internally controlled reaction (imposed) category. Distinguishing these two scales captures more of the complexities of personal causation than did the total Origin score. An Origin, especially a child, expresses himself as a causal agent by striving for intrinsically relevant goals and by striving for goals set for him by other persons in his environment.

We began this paper with a model which stated that academic achievement is a function of intrinsic and imposed motivation and I.Q. For each of the subscales of the Iowa Test of Basic Skills, the I.Q. measure accounts for a significant amount of the variance alone. However, when variance due to motivation is accounted for first and then variance due to ability is added, the total variance accounted for increases. For the vocabulary scale the full model accounts for 12 percent more variance than does I.Q. alone. Thirty percent of the total variance is accounted for by the motivation measures; I.Q. adds 49 percent. The variance accounted for by the full model on the arithmetic scale is 8 percent more than by I.Q. alone; 18 percent by the motivation measures plus 37 percent by I.Q. The full model accounts for 1 percent more variance on the reading and language scales than does I.Q. alone. Thus

motivation plus ability is a better predictor of vocabulary and arithmetic achievement than is I.Q. alone.

Both intrinsic and imposed goal measures are accounting for significant portions of the vocabulary variance over and above variance due to I.Q. The intrinsic and imposed goal measures, moreover, are apparently tapping different sources of variance in language and arithmetic.

The intrinsic measure significantly accounts for variance on language after I.Q. is controlled and the imposed measure significantly accounts for arithmetic variance after I.Q. is controlled. While these specific results were not predicted, a post hoc examination of the Iowa Test of Basic Skills (Lindquist & Hieronymus, 1955) suggests that the imposed goal measure is related to specific right or wrong decisions. The arithmetic scale measures the process or reasoning behind an answer in so far as the correct computations result in the correct numerical value. The language subscale, on the other hand, involves choosing the one grammatically incorrect phrase from a list of phrases. The student may decide on the basis of what does not make sense to him rather than on the basis of specific grammatical rules. Decisions on the basis of what makes sense may be related to the intrinsically set goals, planned activity, realistic perception, responsibility and

self-confidence measured by the intrinsic motivation measure. The vocabulary scale is related to both intrinsic and imposed measures. The student is confronted with a word in a phrase and asked to choose a synonym. If he knows the specific meanings of the listed words (imposed), he chooses the word which has the same meaning to him (intrinsic) as the cue phrase.

These post hoc explanations are of course tentative. The results indicate that the intrinsic and imposed measures are accounting for variance on vocabulary, language and arithmetic achievement measures over and above that due to I.Q. The relations with reading were not significant after I.Q. was held constant. As further motivation scoring is completed these results will be tested as planned comparisons.

Summary

This study is one in a series investigating the relationship between motivation training and measures of individual motivation and school behavior of elementary school pupils. One-hundred and twenty-two seventh grade students from an inner-city school district were divided into experimental and control groups by random assignment of classrooms. Motivation training was given to teachers in the experimental classrooms and then training units emphasizing feelings of personal causation were designed by the authors

in collaboration with the teachers and used by the teachers in their classrooms. Effects of the motivation training on the experimental children were not significant in the sample although trends suggested that a larger sample (which can be scored) might make the trends significant.

The measure of personal causation motivation used in a previous study was coded for two sub-scales measuring intrinsically relevant motivation and imposed motivation. Using these two measures in conjunction with a measure of ability (intelligence), it was possible to demonstrate significant portions of variance accounted for by the motivation measure over and above that accounted for by intelligence.

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Appendix A

Plimpton's (1969) scoring definitions did not distinguish between intrinsically relevant and internally controlled reaction to imposed goals. For theoretical reasons we divided each of the five categories into an intrinsically and an imposed relevance category. Thus, if the main character in the story explicitly states a personally set goal, the story receives one point for an intrinsically set goal. If, on the other hand, the explicitly stated goal is originated by another person in the story or by environmental circumstances and the main character accepts the goal as his own, the story is scored for imposed goal relevance. Internally controlled instrumental activity is scored for present tense activity toward a goal which is internally determined by the main character. Imposed instrumental activity is scored when another character or the circumstances determine the goal striving activity which the "hero" has accepted. Realistic perception refers to the character's perception of blocks, cause-effect relations, insight, acceptance of expertness, compromise or intelligent adjustment to goal related difficulties. If the realistic perception originates with the main character, it is scored for intrinsic relevance; if it originates outside the main character, it is scored imposed. Statements scored for personal responsibility reflect a willingness to assume responsibility for the consequences of actions, the attainment of goals, or the solution of problems.

Intrinsic relevance is scored when the personal responsibility statements are originated by the "hero". Imposed is scored if the character acts responsibly or accepts responsibility for an external goal or event or in response to another's goal. Self-confidence is scored for a non-conditional positive outcome of goal striving action. Intrinsic scoring usually reflects the result of intrinsically determined activity and imposed scoring, imposed goal striving.

Each story can be scored either intrinsic or imposed for each of the five categories present in that story. The total intrinsic and imposed scores are obtained by adding over all six stories.